

## F. Limits on Emissions Between 1605 MHz and 1610 MHz

### 1. 1.6 GHz METs

60. The NTIA did not recommend specific suppression requirements for MET emissions in the 1605-1610 MHz segment of the ARNS band in its petition for rulemaking. Instead, it simply recommended that the Commission deal on an *ad hoc* basis with any problem of interference with GNSS reception in frequencies above 1605 MHz arising prior to the down-migration of GLONASS in 2005. The Commission noted in the *Notice*, however, that the ITU advocates suppression of out-of-band emissions from non-geostationary-satellite-system TDMA METs with uplink frequencies between 1 and 3 GHz to levels between 1605 MHz and 1610 MHz determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz.<sup>114</sup> The Commission invited comment on the advisability of including a similar requirement in its rules in lieu of the NTIA's suggested provision for *ad hoc* resolution.<sup>115</sup>

61. In its comments on the *Notice*, the NTIA still advocates *ad hoc* resolution of problems of interference with GLONASS reception in frequencies between 1605 MHz and 1610 MHz arising before 2005.<sup>116</sup> The NTIA maintains, however, that it would be beneficial both for MSS operators and manufacturers of GNSS receivers to establish a definite emission limit for the 1605-1610 MHz segment for protection of GLONASS after its final down-migration. To that end, the NTIA advocates adoption of the pertinent limit recommended by the ITU in REC M.1343.<sup>117</sup> As the NTIA does not say otherwise, we construe its comments to mean that the limit should apply to CDMA, as well as TDMA, METs and to 1.6 GHz METs used with GSO MSS systems as well as to Big LEO METs.

62. Motorola, Iridium LLC, and the Globalstar licensees likewise advocate adoption of the limit for 1605-1610 MHz proposed in REC M.1343.<sup>118</sup> Motorola contends that the FCC's rule for suppressing emissions in the 1605-1610 MHz segment should be consistent with the ITU's standard and that promulgating a definite limit would avoid potentially intractable disputes over allegations of harmful interference to GLONASS. ARINC argues for a somewhat stricter wideband limit: linear interpolation from -70 dBW/MHz at 1605 MHz to -14 dBW/MHz (rather than -10 dBW/MHz) at 1610 MHz.<sup>119</sup> ARINC maintains that its recommendation is supported by the findings of the aviation contingent of RTCA SC-159.

<sup>114</sup> ITU-R REC. M.1343. The European Union has adopted the ITU's recommendation in this regard. ETSI TBR-41, *supra*.

<sup>115</sup> *Notice* at ¶83.

<sup>116</sup> NTIA Comments at 15; *see also* Constellation Comments, Appendix A at 4.

<sup>117</sup> *Id.*

<sup>118</sup> Motorola Comments at 17; Iridium Reply at 10; Globalstar Comments at 26.

<sup>119</sup> ARINC Comments at 6.

63. For the reasons expounded by the NTIA and other commenters for adhering to the ITU standard, we are adopting a requirement that the e.i.r.p. density of out-of-band emissions in the 1605-1610 MHz band segment from 1.6 GHz METs placed in service after [effective date] shall not exceed a level determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz and that grandfathered 1.6 GHz METs will become subject to the same requirement as of January 1, 2005. In view of the NTIA's advocacy of this limit, with the FAA's concurrence, we are not persuaded that it would serve the public interest to require Big LEO METs to meet the stricter wideband limit that ARINC advocated. As discussed below, however, we are proposing adoption of stricter limits on out-of-band emissions in the 1605-1610 MHz segment from 1.6 GHz METs with uplink assignments above 1626.5 MHz.

## 2. Two Gigahertz METs

64. The Commission proposed in the 2 GHz NPRM to require 2 GHz METs to meet the same wideband limit on emissions in the 1605-1610 MHz segment that it had suggested in this proceeding as a limit for 1.6 GHz METs: *i.e.*, -70 dBW/MHz interpolated up to -10 dBW/MHz at 1610 MHz.<sup>120</sup> In comments on the 2 GHz NPRM, the NTIA recommended adoption of a stricter limit for 2 GHz METs in this respect.<sup>121</sup> Specifically, it recommended that 2 GHz METs be required to meet a -70 dBW/MHz limit on emissions throughout the ARNS band, with no slope-off in the 1605-1610 MHz segment. The NTIA explained that the sloped limit proposed in the 2 GHz NPRM in accordance with its initial recommendation was dictated by a compromise between the Big LEO licensees and aviation-industry representatives in light of the degree of suppression achievable by Big LEO METs. The NTIA maintained that although it may be infeasible for Big LEO METs, operating in a frequency band immediately above 1610 MHz, to meet a -70 dBW/MHz limit at the upper edge of the 1559-1610 MHz ARNS band, there is no comparable difficulty for 2 GHz METs, due to the spectral separation between their allocated uplink band and the ARNS band. The NTIA stressed, moreover, that its recommendation comported with ITU-R REC M.1343, which recommends requiring 2 GHz METs used with non-geostationary-satellite systems to suppress emissions to -70 dBW/MHz in frequencies from 1559 MHz to 1626.5 MHz. The NTIA also pointed out that the European Testing and Standards Institute had likewise adopted a requirement that emissions from 2 GHz METs shall not exceed -70 dBW/MHz between 1559 MHz and 1626.5 MHz.<sup>122</sup> Thus, the NTIA argued, adoption of its recommendation regarding suppression of 2 GHz MET emissions in the 1605-1610 MHz ARNS segment would promote harmonization of national technical standards, facilitating global roaming of METs.

65. Inmarsat, Globalstar, and ICO agree with the NTIA that 2 GHz METs should be required to meet a straight-across limit of -70 dBW/MHz on emissions between 1605 MHz and 1610 MHz.<sup>123</sup> Celsat America, Inc., asserts, however, that adopting such a requirement instead of the sloped limit proposed in

<sup>120</sup> 2 GHz NPRM, *supra*, at ¶73.

<sup>121</sup> NTIA 2 GHz Comments at 9-12.

<sup>122</sup> ETSI TBR-042, *supra*.

<sup>123</sup> "Reply Comments of Inmarsat Ltd." in Docket 99-81 at 15; "Reply Comments of Globalstar, L.P." in Docket 99-81 at 25; "Reply Comments of ICO Services Limited" in Docket 99-81 at 26.

the 2 GHz NPRM would unduly complicate the 2 GHz licensing process.<sup>124</sup>

66. The NTIA has stated persuasive reasons for adopting a straight-across -70 dBW/MHz limit on wideband emissions from 2 GHz METs in the 1605-1610 MHz band-segment. Celsat's counter-assertion that such a requirement would be unduly burdensome is unsupported by explanation or evidence. Although the 2 GHz NPRM proposed a more lenient rule, interested parties have had opportunity to respond to the NTIA's recommendation in reply comments. We therefore adopt the limit that the NTIA advocated: the e.i.r.p. density of out-of-band emissions from 2 GHz METs shall not exceed -70 dBW/MHz in frequencies between 1605 MHz and 1610 MHz.

### G. Little LEO METs

67. The recommendations in the NTIA's petition for rulemaking did not cover Little LEO METs, which transmit in the 148-150.05 MHz band.<sup>125</sup> In view of the wide separation between the Little LEO mobile-uplink band and the 1559-1610 MHz ARNS band, the Commission surmised in the *Notice* that Little LEO METs operating in compliance with the existing out-of-band emission limits in Section 25.202(f)<sup>126</sup> would not produce wideband emissions stronger than -70 dBW/MHz or narrowband emissions stronger than -80 dBW in frequencies as high as 1559 MHz. The Commission therefore proposed to exempt Little LEO systems from the new limits on emissions in the ARNS band in order to spare the licensees from the cost of establishing compliance, on the premise that a demonstration of compliance from them would be superfluous.<sup>127</sup>

68. Orbital Communications Corporation ("ORBCOMM"), a Little LEO licensee, agrees that there is no need for new restrictions on Little LEO METs for protection of ARNS,<sup>128</sup> but other commenters addressing the issue argue to the contrary. The NTIA maintains that frequency separation alone will not ensure that emissions from Little LEO METs will not disrupt ARNS reception.<sup>129</sup> The NTIA points out that FAA-sponsored researchers found that VHF transceivers operating on assigned frequencies just below the Little LEO mobile-uplink band produced out-of-band emissions in the ARNS

<sup>124</sup> "Reply Comments of Celsat America, Inc." in Docket 99-81 at 27.

<sup>125</sup> "Little LEO" systems offer non-voice mobile satellite services using non-geostationary-orbit satellites. The Little LEO service is also referred to as "NVNG MSS."

<sup>126</sup> Section 25.202(f) specifies general requirements for suppression of out-of-band emissions, applicable to all satellite-service transmitters. 47 C.F.R. § 25.202(f). Unlike the rule we are adopting for protection of ARNS operation, 25.202(f) specifies relative limits that vary as a function of spectral separation from the transmitter's assigned frequencies, rather than specifying fixed limits on the allowable strength of emissions in a particular protected band. As they pertain to emissions in the 1559-1610 MHz ARNS band from METs with assigned frequencies in the L or S bands, the relative limits in 25.202(f) are less strict than those we are adopting here.

<sup>127</sup> *Notice* at ¶93.

<sup>128</sup> "Comments of Orbital Communications Corporation" at 11.

<sup>129</sup> NTIA Comments at 19-22.

band at levels that could disrupt GPS reception.<sup>130</sup> Iridium LLC and Rockwell Collins likewise contend that additional restrictions should be imposed on Little LEO METs for protection of aeronautical satellite radionavigation.<sup>131</sup>

69. The NTIA has not shown that the Volpe study is materially relevant. The authors of the study found that some VHF transceivers sold for use in General Aviation aircraft could interfere with the operation of a GPS receiver mounted in the same aircraft at a distance of one meter from the transceiver. It cannot readily be inferred from that finding that a ground-based Little LEO MET could disrupt operation of a GNSS receiver in an aircraft in approach flight, and no commenter has attempted to show that any of the data compiled in the Volpe study supports such an inference. We note, moreover, that there is, at present, no relevant ITU recommendation for Little LEO METs, as the current ITU recommendations for restricting emissions in the ARNS band pertain only to METs with assigned frequencies between 1 GHz and 3 GHz. Although we have discretion to impose MET emission limits not sanctioned by the ITU, we are unwilling to do so in the absence of convincing grounds for concluding that such unilateral regulation is warranted. Hence we decline to prescribe additional emission restrictions for Little LEO METs on the basis of the record before us.

## H. Other Matters

### 1. Protection for Non-Aeronautical GPS Applications

70. As noted previously, the emissions limits that the NTIA recommended in its petition for rulemaking and that the *Notice* proposed were devised for protection of aeronautical radionavigation. Two commenters – the U.S. GPS Industry Council (“USGPS”) and LSC, Inc. – urge us to adopt stricter requirements in order to protect non-aeronautical applications of satellite radiolocation.<sup>132</sup> USGPS asserts that GPS has never been defined as an exclusively aeronautical service and that Congress has mandated Executive-Branch support for GPS for general civilian use.<sup>133</sup> USGPS and LSC further assert

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<sup>130</sup> *Id.* at 20, citing *VHF Transceiver Emissions in the GPS L1 Band*, Volpe National Transportation Systems Center (1995). The NTIA also demonstrates with calculations that Section 25.202(f) does not require Little LEO METs to suppress emissions in the ARNS band to the extent required by the rules we are adopting here. Specifically, the NTIA calculates that the amount of attenuation in the ARNS band required of Little LEO METs for compliance with 25.202(f) is approximately 32 dB less than is needed for protection of GNSS aeronautical radionavigation from interfering wideband emissions. NTIA Comments, Annex B, at 3-5.

<sup>131</sup> Iridium Reply at 10; Rockwell Comments at 5.

<sup>132</sup> USGPS Comments at 11-13; “LSC Comments on Protection for GPS/GLONASS Radionavigation Systems” filed May 2, 1999 (“LSC Comments”). The U.S. GPS Industry Council is a trade association whose membership includes the principal U.S. manufacturers of GPS equipment.

<sup>133</sup> USGPS cited PL 105-303, amending 42 U.S.C. § 14701 *et seq.*, which, for the stated purpose of “support[ing] ... [GPS] in a manner that will most effectively contribute to the national security, public safety, scientific, and economic interests of the United States,” directs the President to “ensure the operation of [GPS] on a continuous worldwide basis” and to commission an Assistant Secretary of Commerce to “protect [the GPS] spectrum from disruption and interference.”

that a large number of ground-based GPS receivers are in civilian use today and that many of them are employed for such safety-related purposes as search and rescue, disaster relief, ocean and harbor-approach navigation, positioning buoys and other maritime navigational aids, train control and collision avoidance, transportation of hazardous materials, and guidance for ambulances, police cars, and fire-department vehicles. LSC adds that GPS "is one of the leading candidates" for providing Enhanced 911 position-determination capability, which the Commission has mandated for terrestrial wireless telecommunication carriers.<sup>134</sup>

71. USGPS objects to the proposal to allow pre-2002 METs to produce temporarily higher wideband emissions in ARNS frequencies above 1580.42 MHz and higher narrowband emissions in frequencies above 1585.42 MHz. Because many civilian GPS receivers process signals across the entire Y-code bandwidth to obtain better accuracy, USGPS maintains that "-70/-80" suppression should be immediately required throughout the GPS Y-code band, which extends up to 1585.65 MHz. This objection is mooted by our adoption of the NTIA's suggestion to extend immediate "-70/-80" protection up to 1587.42 MHz.

72. Based on an assumed value for receiver antenna gain, LSC estimates that METs would have to suppress wideband emissions to -83 dBW/MHz and narrowband emissions to -93 dBW to afford protection for ground-based GPS equivalent to the protection that the proposed "-70/-80" standard would afford for aeronautical radionavigation. LSC therefore recommends that we impose -83 dBW/MHz and -93 dBW limits on emissions in frequencies used for GPS.<sup>135</sup>

73. The Globalstar licensees dispute LSC's contention that stricter limits are needed for protection of non-aeronautical GPS applications.<sup>136</sup> They maintain that LSC's calculations are based on unsupported and unrealistic assumptions and that its analysis fails to take into account specific operational requirements. For instance, the Globalstar licensees assert that land-mobile GPS reception will inevitably be susceptible to frequent disruption from shadowing and that compensating for that problem with dead reckoning computation<sup>137</sup> or alternative navigation sensors will also suffice to compensate for any temporary disruption from interfering METs. In sum, they contend that LSC has not shown that adoption of the proposed limits would leave any ground-based GPS application vulnerable to life-threatening disruption from MSS out-of-band emissions.

74. LSC's concerns are beyond the scope of the issues framed in the *Notice*, in which we proposed adoption of limits for protection of aeronautical radionavigation via satellite. Whether further limits are needed for protection of ground-based applications of satellite radionavigation is a different

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<sup>134</sup> See *Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems* (Report and Order), 11 FCC Rcd 18,676 (1996), *on recon*, 12 FCC Rcd 22,665 (1997), Second Report and Order, 14 FCC Rcd 10,954 (1999), Third Report and Order, 14 FCC Rcd 17,388 (1999), Fourth Report and Order, 15 FCC Rcd 25,216 (2000), *on recon*, FCC 01-386 (rel. Dec. 28, 2001).

<sup>135</sup> LSC Comments at 3-4 and 31.

<sup>136</sup> Globalstar Reply at 9-12.

<sup>137</sup> *I.e.*, estimation of current position as a function of elapsed time and the direction and estimated average speed of travel since the last reliable position fix.

matter that we decline to address here.<sup>138</sup> USGPS argues that to thus limit the scope of inquiry is arbitrary, but we disagree. We proposed to adopt new limits for protection of aeronautical satellite radionavigation in response to recommendations from the Executive Branch based on concern for aviation safety. The issue was not novel. The problem of protecting aircraft reception of GNSS signals had been long and vigorously debated in the Big LEO rulemaking, in RTCA Special Committee 159, and in ITU proceedings in which U.S. interests were represented. The Commission had declared several years previously, moreover, that it would consider adopting further out-of-band restrictions for protection of GNSS aeronautical radionavigation in light of RTCA recommendations, and discussion ensuing from publication of *RTCA/DO-235* regarding protection requirements for aeronautical applications engendered the compromise proposal submitted in the NTIA's rulemaking petition. Thus, MSS licensees have long been aware of the likelihood that new emissions limits would be adopted for protection of aircraft reception of satellite radionavigation signals and of the contentions of those in the Executive Branch and the aviation industry who have been advocating such action. In contrast, USGPS and LSC did not raise the suggestion that stricter suppression limits should be imposed on METs for protection of ground-based GPS applications until well after the NTIA had requested this rulemaking, and the Executive Branch, which operates the GPS system and plans its further development, has not asked us to expand the scope of this proceeding to consider protection requirements for such non-aeronautical uses.

## 2. Protection for Radio Astronomy

75. The National Research Council's Committee on Radio Frequencies ("CORF") and Cornell University express concern about the potential impact of MET uplink transmission on radio astronomy observation in the 1610.6-1613.8 MHz and 1660-1660.5 MHz bands, which are domestically allocated for Radio Astronomy Service on a co-primary basis.<sup>139</sup> CORF and Cornell maintain that radio astronomy observation is especially vulnerable to emissions from mobile transceivers, both because of their ubiquity and because it is more difficult for astronomers to recognize interference from mobile sources when analyzing data than to account for emissions from stationary sources. Acknowledging that compliance with the existing emissions limits in Section 25.202(f)<sup>140</sup> and the protection-zone requirements in Section 25.213(a)(1)<sup>141</sup> can substantially reduce the potential impact of MET operation on radio astronomy, CORF and Cornell recommend that we cross-reference those provisions in the rules we adopt in this proceeding for METs. Including such a cross-reference would be helpful, they contend, for instruction of equipment manufacturers and service providers, particularly those headquartered outside the United States. The NTIA supports this recommendation. We agree that inserting a cross-reference to those

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<sup>138</sup> It is unclear whether the NTIA devised its recommendation for extension of the interim limits to cover frequencies up to 1587.42 MHz in the interest of protecting aeronautical radionavigation rather than ground-based GPS applications. We are nevertheless adopting the recommendation because none of the affected licensees participating in this proceeding has raised any objection to it.

<sup>139</sup> "Comments of the National Academies' Committee on Radio Frequencies" filed June 21, 1999; "Reply Comments of Cornell University" filed July 21, 1999.

<sup>140</sup> See n.126, *supra*.

<sup>141</sup> Section 25.213(a)(1), which pertains only to Big LEO METs, prohibits transmission in the 1610.6-1613.8 MHz band and the 1613.8-1615.8 MHz band within specified distances of listed radio astronomy sites during periods when astronomical observation in those bands is being conducted. 47 C.F.R. § 25.213(a)(1).

other rule provisions might be helpful and therefore adopt the recommendation. We did not propose this in the *Notice*, but because the mere inclusion of a cross-reference to existing requirements is a non-substantive change, the absence of prior notice is no obstacle.

76. CORF and Cornell also recommend that we promulgate regulations prescribing protection zones and band-specific emissions limits to protect radio astronomy observation in the 1660-1660.5 MHz band from MET-generated interference. Further, they urge us to prohibit MET transmission in that band pending adoption of such regulations. We decline to address these substantive recommendations here, as they are not germane to the inquiry we have conducted in this proceeding in response to the NTIA's petition for adoption of limits to protect aircraft reception of satellite radionavigation signals.

### 3. Polarization

77. LSC asserts that because GPS and GLONASS antennas use Right Hand Circular Polarization ("RHCP"), GPS and GLONASS receivers are less vulnerable to interference from emissions transmitted with Left Hand Circular Polarization than to interference from emissions transmitted with RHCP or linear polarization. LSC therefore urges us to consider adopting a rule requiring METs to operate with LHCP.<sup>142</sup> No one responded to this recommendation in reply comments.

78. LSC has not shown that requiring METs to use LHCP would significantly reduce interference into GPS and GLONASS receivers, which have relatively little polarization discrimination with respect to MET out-of-band emissions. Polarization discrimination has been an effective tool for facilitating spectrum sharing among MSS METs, on the other hand, and implementing LSC's recommendation would preclude its further use for that purpose. Therefore, we do not adopt LSC's suggestion.

### 4. Compensation for Cost of Compliance

79. Motient argues that if we require its METs to meet "-70/-80" limits on emissions in ARNS frequencies up to 1605 MHz by 2005 we should, in turn, require aircraft owners to compensate it for any expense consequently incurred to modify or replace non-conforming METs.<sup>143</sup> As we observed in the *Notice*, however, Motient was on notice when it received its blanket MET license that it would be subject to any out-of-band emission limits deemed necessary for protection of GPS and GLONASS.<sup>144</sup> We are not convinced that there is any justification for requiring aircraft owners to reimburse Motient or other MET licensees for expenses of complying with regulations adopted to ensure aviation safety by preventing interference with aircraft approach guidance with satellite radionavigation systems and facilities sanctioned by the FAA.

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<sup>142</sup> LSC Comments at 32.

<sup>143</sup> Motient Comments at 15.

<sup>144</sup> *Notice* at ¶74.

#### IV. FURTHER NOTICE OF PROPOSED RULEMAKING

80. Several related technical issues that were not raised in time to be addressed in previous public comments merit further consideration in this proceeding.

##### A. Limits for Carrier-Off State

81. When a MET is powered on but is not transmitting a signal it is said to be in a "carrier-off" state. The NTIA did not propose separate emissions limits for METs in the carrier-off state in its petition for rulemaking, and the Commission did not discuss the subject in the *Notice*. In its comments on the *Notice*, however, the NTIA notes that ITU-R REC M.1343 separately specifies recommended limits for carrier-on and carrier-off state. On the assumption that METs are in carrier-off state most of the time, the NTIA contends that MET emissions in the ARNS band should be suppressed to a greater extent when they are in that state in order to reduce the risk of interference from cumulative emissions from several METs. In the absence of such a requirement, the NTIA maintains, the risk to aircraft approach guidance could become unacceptably large. The NTIA therefore recommends that the Commission adopt a carrier-off limit that would be 10 dB more strict than "the carrier-on limit." We construe this as a recommendation for adoption of a carrier-off limit of -80 dBW/MHz. We received no other comments on this subject.

82. Because the NTIA presented the recommendation in the last round of comments and there is consequently no discussion on point in the *NRPM*, we decline to adopt a carrier-off limit in this order. We propose to adopt such a limit in a future order in this proceeding, however, in view of the fact that the NTIA and ITU concur in recommending such action. We note, however, that there is some discrepancy between the NTIA and ITU recommendations in this regard: the ITU advocates a carrier-off limit of -77 dBW/100 kHz, rather than -80 dBW/MHz.<sup>145</sup> The NTIA has not explained why it advocates a different limit for carrier-off emissions than the ITU recommends. Because we believe that it generally serves the public interest to foster international uniformity in technical requirements for METs, and because we are currently unaware of any compelling reason for adopting a divergent national standard, we propose to adopt a requirement that the peak e.i.r.p. density of carrier-off emissions from METs with assigned uplink frequencies between 1 and 3 GHz must be suppressed to -77 dBW/100 kHz or less in the 1559-1610 MHz ARNS band, in keeping with the pertinent ITU recommendations. We invite public comment on this proposal.

##### B. Further Requirements for Suppression in the 1605-1610 MHz Band Segment

###### 1. Wideband Limits for 2 GHz METs and 1.6 GHz METs with Uplink Assignments Above 1626.5 MHz

83. After the time expired for filing comments on the *Notice* in this proceeding, the ITU issued a recommendation for suppression of out-of-band emissions in the 1605-1610 MHz segment of the ARNS band from METs used with global or regional GSO MSS systems with assigned uplink bands between

<sup>145</sup>

See ITU-R REC M.1343 and REC M.1480.



1626.5 MHz and 1660.5 MHz.<sup>146</sup> Specifically, the ITU recommended adoption of a requirement that out-of-band emissions from such METs be suppressed in the 1605-1610 MHz segment to a level determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -46 dBW/MHz at 1610 MHz. We propose to adopt that recommended limit on emissions in the 1605-1610 MHz segment from METs with assigned uplink frequencies between 1626.5 MHz and 1660.5 MHz. We propose to specify January 1, 2005 as the effective date for this requirement. We invite public comment on these proposals.

## 2. Narrowband Limits

84. The Commission did not propose to adopt narrowband limits on emissions in the 1605-1610 MHz segment, either in the *Notice* in this proceeding or in the 2 GHz NPRM. The NTIA's general argument for narrowband limits on emissions in the ARNS band implies, however, that the e.i.r.p. of narrowband spurs in the 1605-1610 MHz segment should be suppressed to a level 10 dB below the pertinent wideband limit, and its comments in the 2 GHz proceeding accordingly include a recommendation for a -80 dBW limit on narrowband emissions in that band segment. As noted, moreover, the ITU likewise maintains, in REC M.1477, that GNSS receivers need an additional 10 dB of protection against discrete emissions of less than 700 Hz in bandwidth. We therefore propose to require suppression of discrete narrowband emissions in the 1605-1610 MHz segment to a level 10 dB below the corresponding limit for wideband emissions. Thus, we propose to adopt a requirement that the e.i.r.p. of discrete emissions of less than 700 Hz from Big LEO METs shall not exceed a level determined by linear interpolation from -80 dBW at 1605 MHz to -20 dBW at 1610 MHz. Similarly, we propose to require that the e.i.r.p. of such emissions from METs with assigned uplink frequencies between 1626.5 MHz and 1660.5 MHz shall not exceed a level determined by linear interpolation from -80 dBW at 1605 MHz to -56 dBW at 1610 MHz and that the e.i.r.p. of such emissions from 2 GHz METs shall not exceed -80 dBW between 1605 and 1610 MHz. We invite public comment on these proposals.

## C. Measurement Issues

85. As previously noted, the NTIA has recommended that the Commission prescribe a 2 millisecond measurement interval for ARNS emission limits pertaining to METs used with TDMA systems. We invite further comment on that recommendation in light of the relevant discussion in this decision.<sup>147</sup> We also invite comment as to whether wideband power-density measurements could vary significantly depending on whether a log-average, linear-average, or true rms detector is used and, if so, whether the Commission should prescribe use of a particular type of detector for testing for compliance with the wideband emission limits that we are adopting here.<sup>148</sup>

## D. Equipment Authorization

86. Although the Commission proposed in the *Notice* to require METs to be type-certified

<sup>146</sup> ITU-R REC M.1480 (2000), Annex 1.

<sup>147</sup> See ¶¶ 48-50, *supra*.

<sup>148</sup> See NTIA Report 01-383, *The Temporal and Spectral Characteristics of Ultrawideband Signals*, January 2001. See, also, Public Notice DA 01-171 (Jan. 24, 2001).

pursuant to Part 2, Subpart J, of its rules before being sold, leased, or shipped or distributed for the purpose of sale or lease in the United States, it proposed to exempt METs permanently installed on ships, boats or planes from the certification requirement.<sup>149</sup> Globalstar objects that there is no apparent basis for such an exemption.<sup>150</sup> Inmarsat argues, on the other hand, that requiring permanently-installed ship METs to be certified under Subpart J would be “needlessly duplicative,” because such terminals are subject to other regulatory approval procedures that require submission of information of the sort that would be required for equipment certification.<sup>151</sup> Inmarsat does not specifically identify the alternative procedures to which it refers, but we note that the Commission has relied on verification, rather than certification, to ensure that Inmarsat ship terminals meet the pertinent technical requirements for maritime stations in Part 80 of its rules.<sup>152</sup> We invite further comment as to whether verification or some other procedure could better be used instead of certification to ensure that ship METs meet emission limits for protection of aeronautical satellite radionavigation.

#### **E. Compliance Deadline for Standard A Maritime Terminals**

87. As previously explained, we are postponing specification of a deadline for Inmarsat Standard A ship terminals carried for GMDSS compliance to meet the final “-70/-80” limits. We invite public comment as to an appropriate future date for that deadline.

### **V. CONCLUSION**

88. We conclude that adoption of a new rule section prescribing limits on out-of-band emissions from 1.6 GHz and 2 GHz METs, as set forth in Appendix A, will serve the public interest by enhancing aviation safety, because it will facilitate reliance on satellite radionavigation for aircraft approach guidance. We further conclude that adoption of these limits will serve the public interest by substantially conforming domestic regulations with pertinent ITU recommendations, thereby promoting international uniformity in technical standards for mobile terminals used with satellite communications systems that provide service both in this country and abroad. We tentatively conclude, moreover, that it would serve the public interest to adopt the additional limits on carrier-off emissions and emissions in the 1605-1610 MHz band-segment that we propose in the Further Notice included herein.

### **VI. PROCEDURAL MATTERS**

#### **A. Ex Parte Presentations**

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<sup>149</sup> Notice at ¶24.

<sup>150</sup> Globalstar Comments at 7.

<sup>151</sup> Inmarsat Reply Comments at 6.

<sup>152</sup> See 47 C.F.R. § 80.203(g). Verification is defined in 47 C.F.R. § 2.902. Certification is defined in 47 C.F.R. § 2.907.

89. The inquiry initiated by the Further Notice of Proposed Rulemaking herein is a "permit-but-disclose" proceeding subject to the "permit-but-disclose" requirements under Section 1.1206(b) of the Commission's rules. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in Commission rules.<sup>153</sup>

## B. Initial Regulatory Flexibility Analysis

90. The Regulatory Flexibility Act of 1980 ("RFA"),<sup>154</sup> requires preparation of an Initial Regulatory Flexibility Analysis ("IRFA") of possible significant economic impact on "small entities" from the rules proposed in the Further Notice of Proposed Rulemaking we are adopting here. Members of the public may file written comments on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the Further NPRM specified below. The Commission will send a copy of this order, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration, and the order and IRFA will be published in the *Federal Register*.

91. *Need for and Objectives of the Proposed Rules:* The Further NPRM proposes adoption of certain additional restrictions on out-of-band emissions from METs with assigned uplink frequencies between 1610 and 1660.5 MHz or between 1990 and 2025 MHz in order to afford interference protection for aircraft reception of satellite radionavigation signals in the 1559-1610 MHz band.

92. *Legal Basis:* Statutory authority for adoption of the proposed rules is established by Sections 4(i), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 303(f), 303(g), and 303(r).

93. *Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply:* The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small businesses that may be affected by the proposed rules, if adopted. The RFA defines "small entity" as referring to a "small business," "small organization," or "small governmental jurisdiction." In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.<sup>155</sup> A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).

94. For satellite telecommunications carriers and resellers the SBA has established a small business size standard that excludes companies with annual receipts in excess of \$12.5 million.<sup>156</sup> Ten companies are currently licensed for operation of 1.6 GHz mobile earth stations subject to the rule requirements we are adopting in this order. We have ascertained from published data that four of those

<sup>153</sup> See generally 47 C.F.R. §§ 1.1202, 1.1203, and 1.1206.

<sup>154</sup> 5 U.S.C. § 603.

<sup>155</sup> 15 U.S.C. § 632

<sup>156</sup> See 13 C.F.R. § 121.201, NAICS Code 513340.

companies are not small entities according to the SBA's definition,<sup>157</sup> but we do not have sufficient information to determine which, if any, of the other six are small entities. We anticipate issuing several licenses for 2 GHz mobile earth stations subject to the requirements we are adopting here. We do not know how many of those licenses will be held by small entities, however, as we do not yet know exactly how many 2 GHz mobile-earth-station licenses will be issued or who will receive them.<sup>158</sup> We request comment on the number and identity of small entities that would be significantly impacted by the proposed rule changes.

95. *Description of Projected Reporting, Recordkeeping and Other Compliance Requirements:* The rules proposed in the Further NPRM would not necessitate use of new forms and or procedures but would require additional specifications to be met in equipment certification of METs subject to the additional emission restrictions.

96. *Steps to Minimize Significant Economic Impact on Small Entities and Significant Alternatives:* The RFA requires an agency to describe any significant alternatives considered before issuing the rulemaking proposal, such as: 1) establishment of different compliance or reporting requirements or timetables that take into account the resources available to small businesses; 2) clarification, consolidation, or simplification of compliance or reporting requirements for small businesses; 3) use of performance, rather than design, standards; and 4) partial or complete exemption for small businesses. We are not aware of any alternative means of achieving our pertinent regulatory objective that would significantly reduce burdens on small businesses, but we invite suggestions in this regard.

97. *Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules:* None.

### C. Initial Paperwork Reduction Act Analysis

98. In proposing adoption of additional emission limits subject to a type-certification requirement, the Further NPRM herein proposes an additional information-collection requirement. The

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<sup>157</sup> Comsat Corporation, Globalstar USA, Honeywell International, Inc., and Mobile Satellite Ventures Subsidiary LLC ("MSVS") each holds one of the current licenses for 1.6 GHz mobile satellite stations. Comsat Corporation reported annual revenue of \$618 million in its most recent annual report to the U.S. Securities and Exchange Commission ("SEC"). Globalstar USA (formerly AirTouch Satellite Services) is a wholly-owned subsidiary of Vodaphone Group Plc. In an annual report filed with the SEC, Vodaphone reported revenue of 15 billion pounds sterling for the year ending March 31, 2001. In another annual report filed with the SEC, Honeywell International Inc. reported receiving sales revenue of \$23.7 billion in 2001. MSVS is wholly owned by a limited partnership that is 48.1% owned by Motient Corporation and 39.9% owned by a limited partnership controlled by a wholly-owned subsidiary of BCE, Inc. In an annual report filed with the SEC, Motient reported revenue of \$93.3 billion for calendar year 2001. BCE, Inc. reports in its corporate website, [www.bce.ca/en/investors/corporate/fast/](http://www.bce.ca/en/investors/corporate/fast/), that it received \$21.1 billion of revenue in 2001.

<sup>158</sup> The Commission has issued space-station licenses for eight Mobile Satellite Service systems that would operate with 2 GHz mobile earth stations. Although we know the number and identity of the space-station licensees, neither the number nor the identity of future 2 GHz mobile-earth-station licensees can be determined from that data.

Commission invites the general public and the Office of Management and Budget (OMB) to comment on this proposed additional information requirement, as required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13. Such public comments are due within 30 days after publication of the Further NPRM in the Federal Register; OMB comments are due within 60 days from the date of publication in the Federal Register. Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

99. Written comments on the proposed information collection requirement should be filed with the Commission's Secretary, and a copy should be submitted to Judy Boley Herman, Federal Communications Commission, Room 1-C804, 445 12<sup>th</sup> Street S.W., Washington, D.C. 20554, or via the Internet to [jbHerman@fcc.gov](mailto:jbHerman@fcc.gov), and Jeanette Thornton, OMB Desk Officer, 10236 NEOB, 725 17<sup>th</sup> Street N.W., Washington D.C. 20503, or via the Internet to [jthornto@mp.eop.gov](mailto:jthornto@mp.eop.gov).

#### **D. Final Paperwork Reduction Act Analysis**

100. This Report and Order requires either new or modified information collections subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under the emergency processing provisions of the PRA. The Commission invites the public and other Federal agencies to comment on information collection(s) required by this Report and Order. Comments should address: (a) whether the new or modified collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

101. Public and agency comments on the request for approval of the information collection requirements are due 60 days after date of publication of this Order in the Federal Register. All comments regarding the requests for approval of the information collection should be submitted to Judy Boley Herman, Federal Communications Commission, Room 1-C804, 445 12<sup>th</sup> Street, SW, Washington, DC 20554, or via the Internet to [jbHerman@fcc.gov](mailto:jbHerman@fcc.gov). In addition, comments on the emergency request for approval of the information collections should be submitted to Jeanette Thornton, OMB Desk Officer, Room 10236 NEOB, 725 17<sup>th</sup> Street, NW, Washington, DC 20503, or via the Internet to [tojthornto@mb.eop.gov](mailto:tojthornto@mb.eop.gov).

#### **E. Procedures for Filing Comments on the Further Notice of Proposed Rulemaking**

102. Pursuant to Sections 1.415 and 1.419 of the Commission's rules,<sup>159</sup> interested parties may file comments on the Further Notice of Proposed Rulemaking on or before 60 days from publication in the Federal Register and reply comments 90 days after publication in the Federal Register. Comments may be filed using the Commission's Electronic Comment Filing System ("ECFS") or by submitting paper copies.<sup>160</sup> See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 Fed. Reg. 24121 (1998). Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Commenters must transmit one electronic copy of their comments for each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to [ecfs@fcc.gov](mailto:ecfs@fcc.gov), and should include the following words in the body of the message, "get form <your e-mail address>." A sample form and directions will be sent in reply.

103. Parties who choose to file by paper must file an original and six copies of each filing. Paper filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). The Commission's contractor, Vistrionix, Inc., will receive hand-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Compton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12<sup>th</sup> Street, SW Washington, D.C. 20554. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission. Comments and reply comments should be captioned using the docket number for this proceeding.

104. Parties who choose to file by paper should also submit their comments on diskette. The diskettes should be submitted to the Commission's Secretary, Marlene H. Dortch, Office of the Secretary, Federal Communications Commission, Portals II, 445 12<sup>th</sup> Street, S.W., Washington, D.C. The Commission's contractor, Vistrionix, Inc., will receive hand-delivered diskette filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Compton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class mail, Express Mail, and Priority Mail should be addressed to 445 12<sup>th</sup> Street, SW Washington, D.C. 20554. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission. Such a submission should be on a 3.5-inch diskette formatted in an IBM compatible format using Word for Windows or compatible software. The diskette should be accompanied by a cover letter and should

<sup>159</sup> 47 C.F.R. §§ 1.415 and 1.419.

<sup>160</sup> See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24,121 (1998).

be submitted in "read only" mode. The diskettes should be clearly labeled with the commenter's name, the docket number of this proceeding, type of pleading (comment or reply comment), date of submission, and the name of the electronic file on the diskette. The label should also include the following phrase "Disk Copy - Not an Original." Each diskette should contain only one party's pleading, preferably in a single electronic file. In addition, commenters must send diskette copies to the Commission's copy contractor, Qualex International, Portals II, 445 12<sup>th</sup> Street, S.W., Room CY-B402 Washington, D.C. 20554.

105. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center, 445 12<sup>th</sup> Street, S.W., Washington, D.C. 20554.

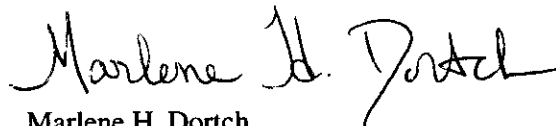
## VI. ORDERING CLAUSES

106. IT IS ORDERED that, pursuant to Sections 4(i), 7(a), 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 157(a), 303(c), 303(f), 303(g), 303(r), 307, 309(a), 310, Part 25 of the Commission's Rules IS AMENDED, as specified in Appendix A, effective 30 days after publication in the Federal Register.

107. IT IS FURTHER ORDERED that the Commission's Consumer Information Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order and Further Notice of Proposed Rulemaking, including the Initial and the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

108. Additional Information. For further information concerning this rulemaking proceeding contact William Bell at (202) 418-0741 (internet: [bell@fcc.gov](mailto:bell@fcc.gov)) or Marcus Wolf at (202) 418-0736 (internet: [mwolf@fcc.gov](mailto:mwolf@fcc.gov)) International Bureau, Federal Communications Commission, Washington, DC 20554.

## FEDERAL COMMUNICATIONS COMMISSION



Marlene H. Dortch  
Secretary

**APPENDIX A**  
**Rule Changes**

Title 47 of the Code of Federal Regulations, Part 25, is amended as follows:

1. The authority citation for Part 25 continues to read as follows:  
**Authority: Sections 25.101 to 25.601 issued under** Section 4, 48 Stat. 1066, **as amended**; 47 U.S.C. 154. **Interpret or apply** Sections 101-104, 76 Stat. 419-427; 47 U.S.C. 701-744; 47 U.S.C. 554.
2. Section 25.213 is amended by deleting Paragraph (b).
3. Section 25.200 is deleted.
4. A new section 25.216 is added and reads as follows:

**Section 25.216 *Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service***

- (a) The e.i.r.p. density of emissions from mobile earth stations placed in service on or before July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1660.5 MHz shall not exceed -70 dBW/MHz, averaged over any 20 millisecond interval, in the band 1559-1587.42 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth generated by such stations shall not exceed -80 dBW, averaged over 20 milliseconds, in that band.
- (b) The e.i.r.p. density of emissions from mobile earth stations placed in service on or before July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1626.5 MHz shall not exceed -64 dBW/MHz, averaged over 20 milliseconds, in the 1587.42-1605 MHz band. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth generated by such stations shall not exceed -74 dBW, averaged over 20 milliseconds, in the 1587.42-1605 MHz band.
- (c) The e.i.r.p. density of emissions from mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1660.5 MHz shall not exceed -70 dBW/MHz, averaged over 20 milliseconds, in the 1559-1605 MHz band. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed -80 dBW, averaged over 20 milliseconds, in the 1559-1605 MHz band.
- (d) As of January 1, 2005 and from then on, the e.i.r.p. density of emissions from mobile earth stations placed in service on or before July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1660.5 MHz (except Standard A Inmarsat terminals used as Global Maritime Distress and Safety System ship earth stations) shall not exceed -70 dBW/MHz, averaged over 20 milliseconds, in the 1559-1605 MHz band or a level in the 1605-1610 MHz band determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz, and the e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed -80 dBW, averaged over 20 milliseconds, in the 1559-1605 MHz band.
- (e) The e.i.r.p. density of emissions from mobile earth stations with assigned uplink frequencies between 1990 MHz and 2025 MHz shall not exceed -70 dBW/MHz, averaged over 20 milliseconds, in frequencies between 1559 MHz and 1610 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed -80 dBW, averaged over 20 milliseconds, in frequencies between 1559 MHz and 1605 MHz.
- (f) Mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies in the 1610-1660.5 MHz band shall suppress the power density of emissions in the 1605-1610 MHz band to an extent determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610



MHz.

NOTE: Operation of mobile earth stations is also subject to all pertinent emissions limits specified in other sections of the Commission's Rules. See Sections 25.202(f) and 25.143(a).

**APPENDIX B**  
**Proposed Rule Changes**

Title 47 of the Code of Federal Regulations, Part 25, is amended as follows:

1. Paragraph (e) of Section 25.216 is amended to read as follows:

(e) The e.i.r.p. density of emissions from mobile earth stations with assigned uplink frequencies between 1990 MHz and 2025 MHz shall not exceed -70 dBW/MHz, averaged over 20 milliseconds, in frequencies between 1559 MHz and 1610 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed -80 dBW, averaged over 20 milliseconds, in that frequency band.

2. Section 25.216 is amended by inserting the following paragraphs after Paragraph (f):

(g) Mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies in the 1626.5-1660.5 MHz band shall suppress the power density of emissions in the 1605-1610 MHz band-segment to an extent determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -46 dBW/MHz at 1610 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed a level determined by linear interpolation from -80 dBW at 1605 MHz to -56 dBW at 1610 MHz.

(h) The peak e.i.r.p. density of carrier-off-state emissions from mobile earth stations with assigned uplink frequencies between 1 and 3 GHz shall not exceed -77 dBW/MHz in the 1559-1610 MHz band.

(h) No mobile earth station subject to the requirements of this section may be operated after January 1, 2005 unless its conformance with pertinent requirements specified in this section with respect to operation after that date has been demonstrated pursuant to the certification procedure prescribed in Part 2, Subpart J, of the Commission's rules.

## APPENDIX C

### Final Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980, as amended ("RFA"),<sup>161</sup> requires a regulatory flexibility analysis to be prepared for notice-and-comment rulemaking proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."<sup>162</sup> As required by the RFA, the original Notice of Proposed Rulemaking in this proceeding included an Initial Regulatory Flexibility Analysis ("IRFA").<sup>163</sup> The Commission invited written public comment on the rulemaking proposal and on the IRFA. This Final Regulatory Flexibility Analysis is also included in compliance with the RFA.<sup>164</sup>

#### A. Need for and Objectives of this Report and Order

The purpose of this Report and Order is to adopt a rule specifying limits on the permissible strength of emissions produced by mobile earth stations outside their assigned frequency bands, in order to prevent interference with aircraft reception of satellite radionavigation signals in the 1559-1610 MHz band.

#### B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

None of the comments filed in this proceeding discussed the IRFA.

#### C. Description and Estimate of the Number of Small Entities to Which the New Rule Will Apply

The RFA directs agencies to provide a description of, and when feasible, an estimate of the number of, small "entities" that may be affected by the rules they adopt.<sup>165</sup> The RFA generally defines the term "small entity" as referring to a "small business," "small organization," or "small governmental jurisdiction."<sup>166</sup> The term "small business" has the same meaning as the term "small business concern" under the Small Business Act.<sup>167</sup> A "small business concern" is one which: (1) is independently owned

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<sup>161</sup> The RFA, *see* 5 U.S.C. § 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

<sup>162</sup> 5 U.S.C. § 605(b).

<sup>163</sup> *See Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communication by Satellite (GMPCS) Memorandum of Understanding and Arrangements/ Petition of the National Telecommunications and Information Administration to Amend Part 25 of the Commission's Rules to Establish Emission Limits for Mobile and Portable Earth Stations Operating in the 1610-1660.5 MHz Band*, Notice of Proposed Rulemaking, 14 FCC Rcd 5871 (1999).

<sup>164</sup> *See* 5 U.S.C. § 604.

<sup>165</sup> 5 U.S.C. § 604(a)(3).

<sup>166</sup> 5 U.S.C. § 601(6).

<sup>167</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).<sup>168</sup>

For satellite telecommunications carriers and resellers, the SBA has established a small business size standard that excludes companies with annual receipts in excess of \$12.5 million.<sup>169</sup> Ten companies are currently licensed for operation of 1.6 GHz mobile earth stations subject to the rule requirements we are adopting in this order. We have ascertained from published data that four of those companies are not small entities according to the SBA's definition,<sup>170</sup> but we do not have sufficient information to determine which, if any, of the other six are small entities. We anticipate issuing several licenses for 2 GHz mobile earth stations subject to the requirements we are adopting here. We do not know how many of those licenses will be held by small entities, however, as we do not yet know exactly how many 2 GHz mobile-earth-station licenses will be issued or who will receive them.<sup>171</sup>

#### **D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities**

In this Report and Order, the Commission prescribes limits on the permissible strength of emissions in the 1559-1610 MHz frequency band that may be generated by mobile earth stations with assigned transmission frequencies between 1610 MHz and 1660.5 MHz or between 1990 MHz and 2025 MHz. Those licensed by the Commission to operate, or supervise operation of, such mobile earth stations will be obliged to ensure that the equipment covered by their licenses performs in compliance with the new emission restrictions. Some licensees may find it necessary to alter, replace, or decommission equipment currently in service in order to comply. We do not know, nor do the comments filed in this proceeding indicate, how much expense the pertinent companies may incur to achieve compliance with the new emission limits. The rule we are adopting here does not impose reporting or

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<sup>168</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

<sup>169</sup> See 13 C.F.R. § 121.201, NAICS Code 513340.

<sup>170</sup> Comsat Corporation, Globalstar USA, Honeywell International, Inc., and Mobile Satellite Ventures Subsidiary LLC ("MSVS") each holds one of the current licenses for 1.6 GHz mobile satellite stations. Comsat Corporation reported annual revenue of \$618 million in its most recent annual report to the U.S. Securities and Exchange Commission ("SEC"). Globalstar USA (formerly AirTouch Satellite Services) is a wholly-owned subsidiary of Vodaphone Group Plc. In an annual report filed with the SEC, Vodaphone reported revenue of 15 billion pounds sterling for the year ending March 31, 2001. In another annual report filed with the SEC, Honeywell International Inc. reported receiving sales revenue of \$23.7 billion in 2001. MSVS is wholly owned by a limited partnership that is 48.1% owned by Motient Corporation and 39.9% owned by a limited partnership controlled by a wholly-owned subsidiary of BCE, Inc. In an annual report filed with the SEC, Motient reported revenue of \$93.3 billion for calendar year 2001. BCE, Inc. reports in its corporate website, [www.bce.ca/en/investors/corporate/fast/](http://www.bce.ca/en/investors/corporate/fast/), that it received \$21.1 billion of revenue in 2001.

<sup>171</sup> The Commission has issued space-station licenses for eight Mobile Satellite Service systems that would operate with 2 GHz mobile earth stations. Although we know the number and identity of the space-station licensees, neither the number nor the identity of future 2 GHz mobile-earth-station licensees can be determined from that data.

recordkeeping requirements.

**E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered**

The RFA requires an agency to describe any significant alternatives that it has considered that might reduce economic impact on small entities, such as: establishing different compliance or reporting requirements or timetables that take into account the resources available to small entities; clarifying, consolidating, or simplifying such requirements for small entities; using performance rather than design standards; or completely or partially exempting small entities from new requirements.<sup>172</sup>

We have not considered exempting small entities from the emission limits we are adopting here or prescribing more lenient requirements or compliance timetables for small entities, as we do not believe that such measures could be effected without thwarting fulfillment of our regulatory objective of preventing interference. We have taken steps, however, to minimize adverse impact on affected licensees. Most notably, in the interest of minimizing consequent equipment obsolescence, we have decided to exempt equipment currently in service from full compliance until January 1, 2005.

**Report to Congress:** The Commission will send a copy of this Report and Order and Further Notice of Proposed Rulemaking, including a copy of this Final Regulatory Flexibility Analysis ("FRFA"), in a report to Congress pursuant to the Congressional Review Act.<sup>173</sup> The Commission will also send a copy of this Report and Order and FRFA to the Chief Counsel for Advocacy of the SBA, and a copy of the Report and Order and FRFA (or a summary thereof) will be published in the Federal Register.<sup>174</sup>

<sup>172</sup> 5 U.S.C. § 605(c)(1)-(c)(4).

<sup>173</sup> See 5 U.S.C. § 801(a)(1)(A).

<sup>174</sup> See 5 U.S.C. § 605(b).